

Application/Control Number: 09/922,363

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This listing of the claim will replace all prior versions, and listings, of the claim in the application:

Listing of Claims:

What is claimed is:

1. (currently amended) A spectrometer, comprising:
 - a source of a primary beam of radiant energy;
 - a beamsplitter fixed in relation to the primary beam, for dividing primary beam into at least first and second energy beams which follow first and second optical paths;
 - a filter for modifying a laser modulation;
 - a ~~tunable solid state~~ vertical cavity surface emitting reference laser coupled to the spectrometer ~~through~~ and to a ~~the~~ filter;
 - a current for tuning the laser;
 - at least one return reflector for reflecting the first beam back to the beamsplitter;
 - at least one radiant energy detector; and
 - a control, data acquisition and processing electronic

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system.

2. (withdrawn) A spectrometer, comprising:
 - a source of a primary beam of radiant energy;
 - a beamsplitter fixed in relation to the primary beam, for dividing primary beam into a least first and second energy beams which follow first and second optical paths;
 - at least one return reflector for reflecting the first beam back to the beamsplitting means;
 - at least one radiant energy detector;
 - a control, data acquisition and processing electronic system;
 - a roof reflector rigidly coupled to the beamsplitter for the purpose of folding the second beam by an angle;
3. (withdrawn) A spectrometer, comprising:
 - a source of a primary beam of radiant energy;
 - a beamsplitter fixed in relation to the primary beam, for dividing primary beam into a least first and second energy beams which follow first and second optical paths;

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at least one return reflector for reflecting the first beam
back to the beamsplitting means;

at least one radiant energy detector;

a control, data acquisition and processing electronic
system;

at least one flat compensator plate, having parallel faces,
which may be scanned by nutation to vary the optical path
difference;

4. (previously presented) The spectrometer of claim 1 where
the filter is an etalon.

5. (cancelled)

6. (currently amended) The spectrometer of claim 1 where the
~~solid-state~~ vertical cavity surface emitting laser has a
linewidth of less than one wavenumber.

7. (cancelled)

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8. (withdrawn) The roof reflector assembly of claim 2 where the assembly is fabricated from ceramic;
9. (withdrawn) The roof reflector assembly of claim 2 where the reflective coating is prepared by replication;
10. (withdrawn) The spectrometer of claim 3 where a second refractive scanning plate is interposed in the first or second beam;
11. (currently amended) The spectrometer of claim 1 where the signal generated by the ~~solid-state~~ vertical cavity surface emitting reference laser is demodulated;
12. (previously presented) The spectrometer of claim 1 wherein the detector further comprises a transfer function and wherein an additional source of radiant energy is used to probe the transfer function of the detector ~~or detectors~~.
13. (previously presented) The spectrometer of claim 1 wherein

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the detector further comprises a transfer function and the
transfer function of the detector is inverted by the use of
an adaptive filter.

14. (previously presented) The spectrometer of claim 1 where
the radiation detector detects an optically subtracted
beam;
15. (previously presented) The spectrometer of claim 1 further
comprising an additional source of radiant energy acting as
a signal probe providing a response, and wherein the
detector further comprises a detector signal, and whereby
the detector signal is modified by the control, data
acquisition and processing electronic system to correct for
nonlinear response using the response to the probe signal;
16. (withdrawn) The spectrometer of claim 2 where the detector
signal is modified to correct for nonlinear response using
the response to a probe signal;

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17. (withdrawn) The spectrometer of claim 3 where the detector signal is modified to correct for nonlinear response using the response to a probe signal.